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REPORT

OF

WILLIS G. TUCKER, M. D., Ph. D.,

ANALYST OF DRUGS.

[EXTRACT FROM THE TENTH ANNUAL REPORT.]

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LEWIS BALCH, M. D., *Secretary of the State Board of Health of New York:*

DEAR SIR.— During the past year the collection and examination of drugs from retail dealers in different parts of the State has been continued, under your direction, and in substantially the same manner as heretofore. Four hundred and seventeen, samples of pharmacopœial drugs, preparations and chemicals, purchased from druggists in twenty places, and 115 samples of cream of tartar, purchased from retail grocers, have been examined and reported upon during the year, making a total of 532 samples examined since time of making last annual report. Monthly reports, accompanied by a separate report on each sample examined, have been regularly submitted and the latter have given in each instance the record number and pharmacopœial name of the article tested; name and place of business of dealer from whom purchased; date of purchase, amount called for, price paid and name of collector. The quality of the article, as determined by the analysis, has likewise been stated, the same standards being employed that have heretofore been used. Concerning these standards I quote from a previous report: "Samples are classed as of 'good quality' when they fulfill the requirements of the United States pharmacopœia or fall below the same, only in some trifling and unimportant respect; of 'fair quality' if, while not fully up to the pharmacopœial standard, they are evidently neither intentionally adulterated nor decidedly below such standard, and of 'inferior quality,' if clearly adulterated or falsified, lacking in any important constituent, deficient in strength from improper manufacture, partial or complete decomposition or other causes, or containing an undue amount of impurity. In some cases, through ignorance or intent, a wrong article has been sold or some inferior article of a nature similar to that called for has been substituted, and such samples have been classed under the head 'not as called for.'" Articles like the diluted acids, possessing excessive strength, have been classed under that head. The reports have also stated the respects in which samples not of good quality have been found to be deficient or inferior, and have given such other particulars as have been deemed necessary in special cases. Not having been published elsewhere these reports are now collected and embodied in this annual report.

SELECTION OF SAMPLES.

The object of the work, as now carried on, being not so much to determine the proportion of adulterated to pure drugs now found upon the market, as to expose actual adulteration, sophistication and carelessness in the preparation of common drugs and pharmacopœial compounds; inform the public and caution dealers, no attempt has been made to collect a great variety of articles. Therefore, such as are known to be seldom adulterated or impure have not been called for but such substances have been selected as would test the knowledge, accuracy and integrity of the dealer. Some rather unimportant drugs have been collected for this reason though none but officinal (pharmacopœial) articles have been called for. Medicinal alkaloids and preparations containing them having been assigned to another analyst, such articles have been omitted in the collection of samples.

NOTIFICATION OF DEALERS.

Notices have, as heretofore, been promptly sent from the central office to all dealers whose samples have been found to be of inferior quality, warning them to desist from the sale of such articles and it is believed that these notices, which have in most cases been gratefully received and cheerfully complied with, have had a most salutary effect in correcting various errors and abuses. In a number of cases dealers thus notified have written for further information or to explain, excuse or deny the sale of samples complained of, but it has been in no case shown that any reasonable cause for complaint existed. In the tables accompanying this report the name and residence of all dealers from whom samples have been collected are, for the first time, stated.

COLLECTION OF SAMPLES.

The 532 samples examined during the year were collected under my direction by my assistant, Dr. A. G. Losee of Albany, in Albany, Amsterdam, Bath-on-the-Hudson (Rensselaer county), Buffalo, Central Bridge, Cobleskill, Cohoes, East Albany, Fonda, Fort Plain, Greenbush (Rensselaer county), Green Island, Little Falls, Oneonta, Schenectady, Schoharie, St. Johnsville, Syracuse Troy and West Troy. A written order has in every instance been tendered, this order giving in full the officinal names of the articles called for and the amount desired. No good excuse can, therefore, be urged by the seller for any error or substitution in the filling of orders so explicit. All samples have been numbered and fully labeled (the original label if attached by the seller being also preserved) and kept for subsequent examination, if necessary, in any disputed case.

The following table shows the nature and number of the 532 samples examined and the place where purchased. It has been again observed that the price paid bears little relation to the quality of the articles supplied, the highest priced samples being frequently of inferior quality and *vice versa*.

TABLE OF SAMPLES, ETC.

ARTICLE.	PLACE WHERE PURCHASED.																				Total number.
	Albany.	Amsterdam.	Bath-on-Hudson.	Buffalo.	Central Bridge.	Cobleskill.	Cohoes.	East Albany.	Fonda.	Fort Plain.	Greenbush.	Green Island.	Little Falls.	Oneonta.	Schenectady.	Schoharie.	St. Johnsville.	Syracuse.	Troy.	West Troy.	
Acetic acid, diluted	12	2	1	5	...	1	...	2	...	...	1	...	1	2	3	...	...	4	6	...	40
Alcohol	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	9	...	...	14
Benzoic acid	...	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6
Bismuth, subnitrate of	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4
Cerium, oxalate of	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4
Chloral	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	8	...	...	10
Chloroform, purified	...	...	...	...	1	...	...	...	...	2	...	2	1	1	...	...	...	11	3	...	21
Cream of tartar (from grocers).	115	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	115
Ether, compound spirit of	16	...	1	5	...	1	...	1	...	...	2	1	...	2	5	1	1	8	4	1	49
Ether, spirit of nitrous.	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	2
Ether, stronger	32	...	...	...	1	1	2	2	2	3	2	1	2	1	2	...	1	13	2	1	68
Hydrobromic acid, diluted	20	7	...	...	...	...	2	...	...	1	...	...	1	...	1	...	...	1	5	...	38
Hydrochloric acid, diluted	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	10
Ipecac, powdered	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	5
Nitric acid, diluted	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	1	...	4
Potassium and sodium, tart of.	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3
Potassium, iodide of	...	1	...	...	...	1	...	...	1	...	...	...	2	...	...	1	1	...	1	...	8
Saffron (*crocus*)	...	3	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	6	8	...	21
Santonin	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4
Seidlitz powder	...	1	...	...	...	...	...	...	1	...	...	...	1	1	...	1	1	...	1	...	7
Sulphur, precipitated	9	...	...	...	...	...	...	1	...	...	1	...	...	...	3	...	...	10	5	2	31
Sulphur, washed	...	...	...	...	...	...	...	...	...	...	...	2	...	...	1	...	...	7	4	1	15
Sulphuric acid, diluted	40	...	1	...	...	...	1	3	...	...	3	...	...	...	...	...	...	4	1	...	53
Totals	245	35	3	20	2	4	6	9	4	6	9	6	10	8	19	4	4	92	41	5	532

METHODS OF ANALYSIS.

None but pharmacopœial articles having been collected, and the standard of quality prescribed by the Pharmacopœia being the legal standard to which articles included therein must conform, the pharmacopœial tests and analytical methods have been generally followed. While exhaustive analyses have not often been necessary, in most cases at least one quantitative determination has been made.

SUMMARY OF RESULTS.

Of the 532 samples examined there were classed as of:

	Per cent.
Good quality	233 or 43.8
Fair quality	54 or 10.2
Inferior quality	130 or 24.4
Not as called for	33 or 6.2
Excessive strength	24 or 4.5
Fictitious	58 or 10.9

As stated in previous reports these percentages "by no means represent the proportions of good, bad and indifferent drugs on the market and on sale at the stores, since only those articles which were considered likely to be adulterated or known to be frequently of inferior quality, were collected. Had samples of drugs and pharmaceutical preparations been selected at random the proportion of pure and good articles would have been very much larger." The comparatively large proportion of articles wrongly sold reported above as "not as called for" and "fictitious," is chiefly due to the sale of common safflower for real saffron and of cream tartar substitutes by grocers for the genuine article.

The following were the articles examined:

DILUTED ACETIC ACID — (*Acidum aceticum dilutum, U. S. P.*).

Forty samples examined of which there were of good quality, nine; fair, six; inferior, nineteen, and of excessive strength, six. The Pharmacopœia requires six per cent of absolute acetic acid. These samples varied from 1.90 to 32.80 per cent and, rejecting the six samples of excessive strength, averaged 4.6 per cent. Some of these samples have been prepared without any regard to accuracy, and in some cases the practically undiluted acid has been sold. It is not to be expected that such preparations will be made with scientific precision, but gross carelessness in their manufacture is inexcusable. Diluted acetic acid is employed in the preparation of "spirit of mindererus," and if it is below or above the proper strength this solution will be either too weak or too strong, neither of which conditions is desirable. The following table gives a description of each of the samples:

DILUTED ACETIC ACID, U. S. P.

Number of sample.	Date of collection.	OF WHOM PURCHASED.	Where purchased.	Per cent.	Quality.
1337	July 18, 1888	H. V. Roese	Buffalo	4.40	Inferior.
1338	July 18, 1888	E. J. Liebetrut	Buffalo	6.30	Good.
1339	July 18, 1888	Bontecou & Mosher	Buffalo	3.20	Inferior.
1340	July 18, 1888	Rieffenstahl Bros	Buffalo	5.90	Good.
1341	July 18, 1888	J. P. & J. W. Diehl	Buffalo	4.40	Inferior.
1394	July 21, 1888	C. W. Snow & Co	Syracuse	4.00	Inferior.
1395	July 21, 1888	Brown & Dawson	Syracuse	4.10	Inferior.
1396	July 21, 1888	R. E. Smith	Syracuse	1.90	Inferior.
1397	July 21, 1888	J. C. Auchampaugh	Syracuse	3.90	Inferior.
1486	March 26, 1889	Reed Hogan	Cobleskill	3.40	Inferior.
1487	March 26, 1889	E. E. Ford	Oneonta	4.10	Inferior.
1488	March 26, 1889	T. E. Marsh	Oneonta	14.90	Excessive strength.
1492	April 11, 1889	Bradford & Dickinson*	Amsterdam	3.50	Inferior.
1493	April 11, 1889	C. W. Striker*	Amsterdam	7.90	Good.
1494	April 11, 1889	H. G. Babcock & Co*	Little Falls	32.80	Excessive strength.
1524	May 14, 1889	H. Schneider	Troy	3.00	Inferior.
1525	May 14, 1889	C. H. Shacklady	Troy	4.50	Fair.
1526	May 14, 1889	Noncrief & Francis	Troy	4.00	Inferior.
1527	May 14, 1889	R. H. Starbuck	Troy	5.80	Good.
1528	May 14, 1889	J. M. Donnelly	Troy	4.30	Inferior.
1563	May 23, 1889	William Sauter	Schenectady	4.50	Fair.
1564	May 23, 1889	N. H. Kittle	Schenectady	3.40	Inferior.
1565	May 23, 1889	W. T. Hanson & Co	Schenectady	4.20	Inferior.
1587	May 31, 1889	W. H. Flandrau	Troy	3.20	Inferior.

DILUTED ACETIC ACID, U. S. P. — (*Concluded*).

Number of sample.	Date of collection.	OF WHOM PURCHASED.	Where purchased.	Per cent.	Quality.
1638	June 14, 1889	J. W. Heller & Co	Albany	29.90	Excessive strength.
1639	June 15, 1889	Arch. Gilbert	Albany	6.50	Good.
1640	June 15, 1889	J. D. Palmatier	Albany	6.40	Good.
1641	June 15, 1889	Otto Ritzman	Albany	11.70	Excessive strength.
1642	June 14, 1889	Otto Scholz	Albany	30.80	Excessive strength.
1643	June 14, 1889	Turner Bros	Albany	3.20	Inferior.
1700	June 22, 1889	Bassett & Brumaghim	Albany	4.50	Fair.
1701	June 24, 1889	George Boucher	Albany	5.40	Fair.
1702	June 24, 1889	A. L. George	Albany	3.90	Inferior.
1703	June 22, 1889	C. H. Schaeffer	Albany	5.00	Fair.
1704	June 22, 1889	C. H. Smith & Co	Albany	4.80	Fair.
1737	July 5, 1889	J. S. Beaudry	Bath-on-the-Hudson.	30.80	Excessive strength.
1738	July 5, 1889	J. H. McIntyre	East Albany	3.00	Inferior.
1739	July 5, 1889	T. L. Green	Greenbush	6.50	Good.
1740	July 5, 1889	D. Donnelly	East Albany	5.50	Good.
1741	July 6, 1889	G. R. Cardwell	Albany	7.60	Good.

* Second sample.

ALCOHOL — (*Alcohol, U. S. P.*).

Fourteen samples examined, of which there were of good quality twelve; fair quality, one, and one consisted of compound spirit of ether of inferior quality, the dealer having placed the wrong labels upon Nos. 1,384 and 1,392. The samples are described in the following table:

Number of sample.	Date of collection.	OF WHOM PURCHASED.	Where purchased.	Specific gravity at sixty degrees Fahrenheit.	Quality.
1332	July 18, 1888	H. V. Roese	Buffalo	0.819	Good.
1333	July 18, 1888	E. J. Liebetrut	Buffalo	0.821	Good.
1334	July 18, 1888	Bontecou & Mosher	Buffalo	0.823	Good.
1335	July 18, 1888	Rieffenstahl Bros	Buffalo	0.823	Good.
1336	July 18, 1888	J. P. & J. W. Diehl	Buffalo	0.824	Good.
1376	July 20, 1888	G. W. Holloway	Syracuse	0.822	Good.
1377	July 20, 1888	Jones & Hitchcock	Syracuse	0.821	Fair.
1378	July 20, 1888	G. A. Heyne	Syracuse	0.825	Good.
1379	July 21, 1888	Dr. D T. Whyborn	Syracuse	0.821	Good.
1380	July 21, 1888	C. W. Snow & Co	Syracuse	0.821	Good.
1381	July 21, 1888	Brown & Dawson	Syracuse	0.825	Good.
1382	July 21, 1888	L. H. Hollon	Syracuse	0.821	Good.
1383	July 21, 1888	R. E. Smith	Syracuse	0.822	Good.
1384	July 21, 1888	J. C. Auchampaugh	Syracuse	....	Wrong label attached; consists of compound spirits of ether.

Benzoic Acid — (*Acidum Benzoicum, U. S. P.*).

Six samples examined all of which were of good quality as follows :

Number of sample.	Date of collection.	OF WHOM PURCHASED.	Where purchased.	Quality.
1450	March 9, 1889	C. W. Striker	Amsterdam	Good.
1451	March 9, 1889	Powell & Gilbert	Amsterdam	Good.
1452	March 9, 1889	Warnick & Reid	Amsterdam	Good.
1453	March 9, 1889	G. H. Ingraham	Amsterdam	Good.
1454	March 9, 1889	Bradford & Dickinson	Amsterdam	Good.
1455	March 9, 1889	N. C. Becker	Amsterdam	Good.

SUBNITRATE OF BISMUTH — (*Bismuthi subnitras, U. S. P.*).

Five samples examined and all of good quality, as follows:

Number of sample.	Date of collection.	OF WHOM PURCHASED.	Where purchased.	Quality.
1456	March 9, 1889	C. W. Striker	Amsterdam	Good.
1457	March 9, 1889	Powell & Gilbert	Amsterdam	Good.
1458	March 9, 1889	Warnick & Reid	Amsterdam	Good.
1459	March 9, 1889	Joseph Donnelly	Amsterdam	Good.

Oxalate of Cerium — (*Cerii Oxalas, U. S. P.*).

Four samples examined, of which one was of good quality, two of fair quality and one inferior, containing decided traces of metallic impurities, as follows:

Number of sample.	Date of collection.	OF WHOM PURCHASED.	Where purchased.	Quality.
1460	March 9, 1889	E. W. Clark	Amsterdam	Good.
1461	March 9, 1889	G. H. Ingraham	Amsterdam	Fair.
1462	March 9, 1889	Bradford & Dickinson	Amsterdam	Fair.
1463	March 9, 1889	J. A. Barkhuff	Amsterdam	Inferior.

CHLORAL—(*Chloral, U. S. P.*).

Ten samples examined, of which six were of good, three of fair and one of inferior quality, containing traces of hydrochloric acid and other impurities. The following table describes the samples :

Number of sample.	Date of collection.	OF WHOM PURCHASED.	Where purchased.	Quality.
1408	July 21, 1888	P. L. Ryan & Co	Syracuse	Good.
1409	July 21, 1888	J. C. Bowe	Syracuse	Fair.
1410	July 21, 1888	E. A. Eaton	Syracuse	Good.
1411	July 21, 1888	J. W. Young & Co	Syracuse	Fair.
1412	July 21, 1888	E. B. Covert	Syracuse	Inferior.
1413	July 21, 1888	Smith & Dalton	Syracuse	Fair.
1414	July 21, 1888	Newton & Hickock	Syracuse	Good.
1415	July 21, 1888	E. S. Petrie	Syracuse	Good.
1471	March 26, 1889	Alfred Parrott	Schoharie	Good.
1472	March 26, 1889	E. R. Ford	Oneonta	Good.

Purified Chloroform — (*Chloroformum Purificatum, U. S. P.*).

Twenty-one samples examined, of which there were of good quality, fifteen; fair, five; and inferior, one. The U. S. P. requires a specific gravity of 1.485–1.490 at 15 degrees C. (59 degrees F.) The quality of the purified chloroform now on sale is greatly superior to that formerly upon the market. The following table gives a description of the samples:

Number of sample.	Date of collection.	OF WHOM PURCHASED.	Where purchased.	Spec. gravity at 60° Fahr.	Quality.
1352	July 20, 1888	G. W. Holloway	Syracuse	1.490	Good.
1353	July 20, 1888	Jones & Hitchcock	Syracuse	1.490	Good.
1354	July 20, 1888	O. B. Heyne	Syracuse	1.481	Inferior.
1355	July 21, 1888	E. A. Eaton	Syracuse	1.490	Good.
1356	July 21, 1888	Newton & Hickock	Syracuse	1.491	Good.
1357	July 21, 1888	L. H. Hollon	Syracuse	1.490	Good.
1358	July 21, 1888	W. B. Bissell	Syracuse	1.491	Good.
1359	July 21, 1888	D. Derby	Syracuse	1.492	Good.
1360	July 21, 1888	H. E. Richardson	Syracuse	1.482	Fair.
1361	July 21, 1888	W. D. Tallman	Syracuse	1.479	Fair.
1362	July 21, 1888	W. B. Fuller	Syracuse	1.491	Good.
1484	March 26, 1889	C. McCulloch	Central Bridge	1.484	Good.
1485	March 26, 1889	G. E. Moore	Oneonta	1.483	Fair.
1515	April 11, 1889	Devoe & Shumway	Fort Plain	1.492	Good.
1516	April 11, 1889	H. G. Martin & Co	Fort Plain	1.492	Good.
1517	April 11, 1889	E. I. Stinson*	Little Falls	1.490	Good.

1521	May	14, 1889	J. M. Donnelly	Troy	1.487	Good.
1522	May	14, 1889	G. W. Holcomb	Troy	1.489	Good.
1580	May	31, 1889	M. A. Barnhart	Green Island	1.488	Fair.
1581	May	31, 1889	J. L. Wright	Green Island	1.488	Fair.
1590	May	31, 1889	E. F. Leahy	Troy	1.490	Good.

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* Second sample.

"Cream of Tartar"— (*Potassii Bitartras, U. S. P.*).

One hundred and fifteen samples collected from retail grocery stores in the city of Albany, exclusively, were examined, previous investigation having shown that a pure article is almost invariably sold by druggists. The results of the examination of these samples will be surprising to those who are not informed upon this subject, for only thirty of the samples, or twenty-six per cent of the total number, consisted of real and unadulterated cream of tartar. With the exception of six samples, rated as fair, in which the amount of adulterants was comparatively small, the remaining eighty-five samples, were either largely adulterated or entirely fictitious. Of this number, nineteen, rated as inferior, were adulterated either with starch, acid phosphate of lime or sulphate of lime in varying quantities, not less than eighty per cent of the adulterant or make-weight, being present in some instances. Fifty-eight of the samples were entirely fictitious of which number ten were chiefly acid phosphate of lime (containing considerable sulphate); twenty-three were chiefly acid phosphate of lime and starch ; eleven were chiefly tartaric acid and sulphate of lime and fourteen consisted of tartaric acid, sulphate of lime and starch. Two samples consisted of poor baking powder sold by mistake for cream of tartar. The sale of such miserable imitations for real cream of tartar is evidently without excuse and as the fraudulent substitute is frequently sold at the price of the genuine with perhaps less than a quarter and seldom more than half of its strength it is evident that the purchaser is both deceived and defrauded. These substitutes are to be condemned also as being, in all probability, less wholesome than the article they replace. The following table gives particulars concerning the samples:

CREAM OF TARTAR — PURCHASED FROM GROCERS.

Number of sample.	Date of collection.	OF WHOM PURCHASED	Where purchased.	Quality.
1749	October 4, 1889	James Ramsay	Albany ..	97.70 per cent pure; good quality.
1750	October 4, 1889	William McBurney	Albany ..	98.30 per cent pure; good quality.
1751	October 4, 1889	T. G. Crippen	Albany .	Chiefly acid phosphate of lime and starch; fictitious.
1752	October 4, 1889	M. K. Layman	Albany ..	Chiefly tartaric acid and sulphate of line; fictitious.
1753	October 4, 1889	M. A. Byrne	Albany ..	Largely starch; 30.10 per cent cream of tartar; inferior quality.
1754	October 4, 1889	P. H. Farley	Albany ..	Chiefly acid phosphate of lime; fictitious.
1755	October 4, 1889	J. R. Butler	Albany ..	Chiefly acid phosphate of lime and starch; fictitious.
1756	October 4, 1889	W. F. Kearney	Albany ..	Chiefly acid phosphate of lime; some starch; fictitious.
1757	October 4, 1889	M. A. Reilly.............	Albany ..	An inferior baking powder; error in sale.
1758	October 4, 1889	Peter Snyder............	Albany ..	Chiefly acid phosphate of lime; fictitious.
1759	October 4, 1889	Hart & Young	Albany ..	Chiefly tartaric, sulphate of lime and starch; fictitious.
1760	October 4, 1889	W. E. Drislane	Albany ..	96.50 per cent pure; good quality.
1761	October 4, 1889	Stephenson's	Albany ..	Adulterated with starch; 62.70 per cent cream of tartar; inferior quality.
1762	October 4, 1889	Stewart Campbell....	Albany ..	Contains acid phosphate of lime and starch; inferior quality.
1763	October 4, 1889	H. Pemberton...........	Albany ..	Contains acid phosphate of lime and starch; inferior quality.

Cream of Tartar—Purchased from Grocers—(*Continued*).

Number of sample.	Date of collection.	OF WHOM PURCHASED.	Where purchased.	Quality.
1764	October 4, 1889	J. & P. McGinnis	Albany	Chiefly tartaric acid, sulphate of lime and starch; fictitious.
1765	October 4, 1889	E. A. Hobbs	Albany	97.10 per cent pure; good quality.
1766	October 4, 1889	H. Hunt	Albany	98.39 per cent pure; good quality.
1767	October 4, 1889	G. C. Benedict	Albany	Contains a little starch and acid phosphate lime; fair quality.
1768	October 4, 1889	C. E. Tinker	Albany	Chiefly acid phosphate of lime; a little starch; fictitious.
1769	October 4, 1889	Edward Riley	Albany	97.73 per cent pure; good quality.
1770	October 4, 1889	Edward Ryan	Albany	Chiefly tartaric acid, sulphate of lime and starch; fictitious.
1771	October 4, 1889	Thomas Maher	Albany	Contains a little acid phosphate of lime and starch; fair quality.
1772	October 4, 1889	E. Ruff	Albany	Chiefly acid phosphate of lime; fictitious.
1773	October 4, 1889	Wayne & Van Zandt	Albany	Chiefly acid phosphate of lime; some starch; fictitious.
1774	October 4, 1889	F. M. Jones	Albany	Chiefly tartaric acid, sulphate of lime and starch; fictitious.
1775	October 4, 1889	Marker & Garrett	Albany	97.73 per cent pure; good quality.
1776	October 4, 1889	D. T. Fuller	Albany	Contains some acid phosphate of lime and starch; fair quality.
1777	October 4, 1889	F. Thornton	Albany	87.71 per cent pure; fair quality.
1778	October 4, 1889	G. H. Amsdell	Albany	98.98 per cent pure; good quality.

1779	October 4, 1889	A. E. Clow	Albany	Chiefly acid phosphate of lime and starch; fictitious.
1780	October 5, 1889	G. F. Convery	Albany	Chiefly tartaric acid, sulphate of lime and starch; fictitious.
1781	October 5, 1889	T. J. Hannan	Albany	Chiefly acid phosphate of lime; a little starch; fictitious.
1782	October 5, 1889	C. C. Walker	Albany	97 10 per cent pure; good quality.
1783	October 5, 1889	J. H. Downs	Albany	Chiefly real cream of tartar; fair quality.
1784	October 5, 1889	Philip Schaeffer	Albany	Chiefly acid phosphate of lime and starch; fictitious.
1785	October 5, 1889	Peter Deiseroth	Albany	Chiefly tartaric acid and sulphate of lime; fictitious.
1786	October 5, 1889	John Vageline	Albany	Chiefly tartaric acid and sulphate of lime; fictitious.
1787	October 5, 1889	M. S. Keenholts	Albany	Chiefly tartaric acid and sulphate of lime; fictitious.
1788	October 5, 1889	J. H. Pauley	Albany	Chiefly acid phosphate of lime and starch; fictitious.
1789	October 5, 1889	L. H. Kircher	Albany	Largely starch; inferior quality.
1790	October 5, 1889	E. Troidle	Albany	Chiefly real cream of tartar; fair quality.
1791	October 5, 1889	J. W. & J. R. Van Alstyne	Albany	Contains starch and some acid phosphate of lime; inferior quality.
1792	October 5, 1889	Bouton & Vine	Albany	Baking powder sold by mistake; error in sale.
1793	October 5, 1889	William Thornton	Albany	97.10 per cent pure; good quality.
1794	October 5, 1889	E. J. Lord	Albany	97.73 per cent pure; good quality.
1795	October 5, 1889	J. H. Cassidy	Albany	97.73 per cent pure; good quality.
1796	October 5, 1889	J. H. Pepper	Albany	Contains starch and some acid phosphate of lime; inferior quality.
1797	October 5, 1889	Allen Bros	Albany	Chiefly acid phosphate of lime; fictitious.
1798	October 5, 1889	W. C. Randall	Albany	Chiefly acid phosphate of lime and starch; fictitious.

Cream of Tartar — (*Continued*).

Number of sample.	Date of collection.	OF WHOM PURCHASED.	Where purchased.	Quality.
1799	October 5, 1889	A. Distell	Albany	Chiefly starch ; 36.33 per cent cream of tartar ; inferior quality.
1800	October 5, 1889	S. E. Lape	Albany	Chiefly acid phosphate of lime ; fictitious.
1801	October 5, 1889	Mrs. P. Steinbach	Albany	Chiefly acid phosphate of lime ; fictitious.
1802	October 5, 1889	C. F. Karl	Albany	Contains acid phosphate of lime and a little starch ; inferior quality.
1803	October 5, 1889	G. H. Coughtry	Albany	Contains acid phosphate of lime and a little starch ; inferior quality.
1804	October 5, 1889	Thomas White	Albany	Chiefly acid phosphate of lime ; fictitious.
1805	October 5, 1889	K. Flannery	Albany	97.73 per cent pure ; good quality.
1806	October 5, 1889	J. F. Collins	Albany	Chiefly tartaric acid, sulphate of lime and starch; fictitious.
1807	October 5, 1889	James Murphy	Albany	Largely starch ; 22.55 per cent cream of tartar; inferior quality.
1808	October 5, 1889	L. J. Hopkins	Albany	Contains acid phosphate of lime and starch; inferior quality.
1809	October 5, 1889	J. Grogan	Albany	96.48 per cent pure; good quality.
1810	October 5, 1889	George Drew	Albany	Contains acid phosphate of lime and starch; inferior quality.
1811	October 5, 1889	M. J. Dillen	Albany	98.98 per cent pure; good quality.
1812	October 5, 1889	F. W. Van Slyke	Albany	98.39 per cent pure; good quality.
1813	October 5, 1889	Henry Streibert	Albany	Chiefly tartaric acid and sulphate of lime; fictitious.

1814	October 29, 1889	G. S. Rivenburgh	Albany ..	Chiefly acid phosphate of lime and starch; fictitious.
1815	October 29, 1889	Calkins Bros	Albany ..	Chiefly tartaric acid and sulphate of lime; fictitious
1816	October 29, 1889	C. E. Clark..............	Albany ..	Chiefly acid phosphate of lime and starch; fictitious.
1817	October 29, 1889	M. O'Sullivan............	Albany ..	Chiefly tartaric acid, sulphate of lime and starch; fictitious.
1818	October 29, 1889	J. Cantwell & Son........	Albany ..	Chiefly tartaric acid, sulphate of lime and starch; fictitious.
1819	October 29, 1889	B. B. Dunham............	Albany ..	Chiefly tartaric acid, sulphate of lime and starch; fictitious.
1820	October 29, 1889	E. Palmer................	Albany ..	93.97 per cent pure; good quality.
1821	October 29, 1889	T. W. O'Hagan	Albany ..	Chiefly acid phosphate of lime; trifle starch; fictitious.
1822	October 29, 1889	A. S. Moseley............	Albany ..	97.73 per cent pure; good quality.
1823	October 29, 1889	J. Denn..................	Albany ..	Chiefly acid phosphate of lime and starch; fictitious.
1824	October 30, 1889	Arthur Banfill............	Albany ..	98.98 per cent pure; good quality.
1825	October 30, 1889	J. H. Armatage..........	Albany ..	Chiefly acid phosphate of lime; a little starch; fictitious.
1826	October 30, 1889	F. W. Sarauw	Albany ..	Contains some acid phosphate of lime and starch; inferior quality.
1827	October 30, 1889	N. S. Hoff................	Albany ..	99.61 per cent pure; good quality.
1828	October 30, 1889	G. E. Wilson	Albany ..	98.39 per cent pure; good quality.
1829	October 30, 1889	Cass Bros................	Albany ..	97.73 per cent pure; good quality.
1830	October 30, 1889	Link & Becker...........	Albany ..	Chiefly tartaric acid, sulphate of lime and some starch; fictitious.
1831	October 30, 1889	C. T. Armatage..........	Albany ..	99.61 per cent pure; good quality.
1832	October 30, 1889	Ann Kelly................	Albany ..	Mostly starch; some sulphate of lime; acidity equivalent to 10.65 per cent cream of tartar; inferior quality.

Cream of Tartar — (*Concluded*).

Number of sample.	Date of collection.	OF WHOM PURCHASED.	Where purchased.	Quality.
1833	October 30, 1889	D. Fitzpatrick	Albany	99.61 per cent pure; good quality.
1834	October 30, 1889	W. B. Groat	Albany	99.61 per cent pure; good quality.
1835	October 30, 1889	Underhill & Hatt	Albany	98.98 per cent pure; good quality.
1836	October 30, 1889	D. Adler	Albany	Chiefly tartaric acid and sulphate of lime; fictitious.
1837	October 30, 1889	E. J. O'Connor	Albany	Chiefly acid phosphate of lime; a little starch; fictitious.
1838	October 30, 1889	J. A. LaGrange	Albany	Chiefly acid phosphate of lime; a little starch; fictitious.
1839	October 30, 1889	Thomas Callahan	Albany	Chiefly tartaric acid, sulphate of lime and starch; fictitious.
1840	October 30, 1889	J. Foley	Albany	Largely adulterated with sulphate of lime; 18.79 per cent cream of tartar; inferior quality.
1841	October 30, 1889	P. Kelly	Albany	98.98 per cent pure; good quality.
1842	October 30, 1889	T. H. Begnal	Albany	Chiefly acid phosphate of lime; some starch; fictitious.
1843	October 30, 1889	Owen Sweeney	Albany	Chiefly tartaric acid, sulphate of lime and starch; fictitious.
1844	October 30, 1889	H. Benink	Albany	Chiefly tartaric acid and sulphate of lime; fictitious.
1845	October 30, 1889	G. B. Russell	Albany	Chiefly acid phosphate of lime and starch; fictitious.
1846	October 30, 1889	F. G. Bradley	Albany	Chiefly tartaric acid and sulphate of lime; fictitious.

1847	October 31, 1889	George Burkart	Albany	Chiefly acid phosphate of lime; fictitious.
1848	October 31, 1889	H. Albert, Jr.	Albany	99.61 per cent pure; good quality.
1849	October 31, 1889	Winne Bros	Albany	Chiefly acid phosphate of lime and starch; fictitious.
1850	October 31, 1889	J. H. Smith	Albany	Chiefly acid phosphate of lime; a little starch; fictitious.
1851	October 31, 1889	A. Leitch	Albany	Chiefly tartaric acid and sulphate of lime; fictitious.
1852	October 31, 1889	G. H. Shoudy	Albany	Chiefly tartaric acid, sulphate of lime and starch; fictitious.
1853	October 31, 1889	Platto & Van Valkenburgh	Albany	Chiefly tartaric acid and sulphate of lime; fictitious.
1854	October 31, 1889	E. P. Patten	Albany	Adulterated with sulphate of lime; acidity equivalent to 21.92 per cent cream of tartar; inferior quality.
1855	October 31, 1889	W. J. Maher	Albany	Contains some acid phosphate of lime and starch; inferior quality.
1856	October 31, 1889	J. McGowan	Albany	97.73 per cent pure; good quality.
1857	October 31, 1889	Edward Delehanty	Albany	Contains some acid phosphate of lime and starch; inferior quality.
1858	October 31, 1889	H. H. Slingerland & Son	Albany	Chiefly acid phosphate of lime; fictitious.
1859	October 31, 1889	John Horton	Albany	Chiefly acid phosphate of lime; fictitious.
1860	October 31, 1889	P. Becket	Albany	Chiefly acid phosphate of lime and starch; fictitious.
1861	October 31, 1889	M. J. McDonald	Albany	Chiefly tartaric acid, sulphate of lime and starch; fictitious.
1862	October 31, 1889	J. J. Scrafford	Albany	98.39 per cent pure; good quality.
1863	October 31, 1889	James Boyd	Albany	Chiefly acid phosphate of lime and starch; fictitious.

COMPOUND SPIRIT OF ETHER— (*Spiritus Aetheris Compositus, U. S. P.*).

Forty-nine samples examined, of which *four* were of good quality, while there were of fair quality four, and inferior, thirty-nine. One sample consisted of alcohol and another of a mixture of alcohol and chloroform. Concerning this article I quote from my last annual report:

"Compound spirit of ether or 'Hoffman's anodyne' is frequently prescribed by physicians and often employed as a household remedy and while an article of good quality can be procured from responsible manufacturers or prepared without difficulty by the intelligent and careful pharmacist the fact is that a spurious article answering to none of the requirements of the Pharmacopœia is generally sold in its stead because it is cheaper. Hoffman's anodyne is openly quoted at fifty cents a pound in a recent price-list published in a leading pharmaceutical journal which is about one-quarter the price of the real article. This cheap, spurious and worthless article, obtained as a secondary product in the manufacture of ether consists chiefly of alcohol, ether and water with little or none of the ethereal oil upon which the virtue of the preparation largely depends. Dealers may urge that the sale of this spurious article as a household remedy to people who would complain of the price necessarily charged for a genuine article is excusable; but without admitting this as a valid excuse for dispensing a fraudulent and worthless drug it is evident that its sale in response to a physician's prescription or written order giving full title and specifying "U. S. P." is entirely inexcusable and unwarranted and equally blameworthy, whether due to ignorance or cupidity. The habit of keeping two qualities of officinal drugs can not be too strongly condemned but the results of the above examination would seem to show that many dealers, so far as this preparation is concerned, keep only one and that a spurious article. When officinal preparations are called for they should be furnished by the dealer or no sale made."

The specific gravity of this preparation is not stated in the Pharmacopœia but it should be about 0.796. As made by the process laid down in the Pharmacapœia of 1870, in which ether, and not stronger ether, was employed and more of the etheral oil was used, it had a specific gravity of 0.815, but the specific gravity alone is no criterion of quality. The following table gives particulars concerning the samples examined:

COMPOUND SPIRIT OF ETHER, U. S. P.

Number of sample.	Date of collection.	OF WHOM PURCHASED.	Where purchased.	Specific gravity at sixty degrees Fahrenheit.	Quality.
1347	July 18, 1888	H. V. Roese	Buffalo	0.803	Inferior.
1348	July 18, 1888	E. J. Liebetrut	Buffalo	0.799	Inferior.
1349	July 18, 1888	Bontecou & Mosher	Buffalo	0.799	Inferior.
1350	July 18, 1888	Rieffenstahl Bros	Buffalo	0.809	Inferior.
1351	July 18, 1888	J. P. & J. W. Diehl	Buffalo	0.807	Inferior.
1385	July 20, 1888	O. B. Heyne	Syracuse	0.807	Inferior.
1386	July 20, 1888	G. A. Heyne	Syracuse	0.825	Fair.
1387	July 21, 1888	E. B. Covert	Syracuse	0.809	Inferior.
1388	July 21, 1888	Dr. D. T. Whyborn	Syracuse	0.867	Inferior.
1389	July 21, 1888	C. W. Snow & Co	Syracuse	0.868	Inferior.
1390	July 21, 1888	Brown & Dawson	Syracuse	0.854	Inferior.
1391	July 21, 1888	R. E. Smith	Syracuse	0.889	Inferior.
1392	July 21, 1888	J. C. Auchampaugh	Syracuse	......	Wrong label attached Consists of alcohol.
1477	March 26, 1889	C. M. Throop	Schoharie	0.910	Inferior.
1478	March 26, 1889	J. Dillenback	Cobleskill	0.821	Fair.
1479	March 26, 1889	E. E. Ford	Oneonta	0.860	Inferior.
1480	March 26, 1889	T. E. Marsh	Oneonta	....	Labeled "Ether." Is a mixture of chloroform and alcohol.
1520	April 11, 1889	Chas. Whyland	St. Johnsville	0.800	Inferior.
1536	May 14, 1889	D. F. Magill	Troy	0.858	Inferior.
1558	May 23, 1889	G. Steinführer*	Schenectady	0.803	Inferior.
1559	May 23, 1889	G. E. Duryee*	Schenectady	0.806	Inferior.

COMPOUND SPIRIT OF ETHER — (*Continued*).

Number of sample.	Date of collection.	OF WHOM PURCHASED.	Where purchased.	Specific gravity at sixty degrees Fahrenheit.	Quality.
1560	May 23, 1889	Wm. Sauter*	Schenectady	0.800	Inferior.
1561	May 23, 1889	W. T. Hanson & Co*	Schenectady	0.811	Inferior.
1562	May 23, 1889	Van Zandt & Shaffer*	Schenectady	0.798	Inferior.
1582	May 31, 1889	C. A. Whipple*	Troy	0.799	Good.
1583	May 31, 1889	W. H. Flandrau*	Troy	0.802	Good.
1584	May 31, 1889	E. F. Leahy*	Troy	0.807	Good.
1585	May 31, 1889	M. A. Barnhart	Green Island	0.877	Inferior.
1586	May 31, 1889	R. P. Tunnard	West Troy	0.872	Inferior.
1644	June 14, 1889	L. H. Gaus	Albany	0.799	Inferior.
1645	June 14, 1889	W. E. Masten	Albany	0.847	Inferior.
1646	June 15, 1889	H. Miller	Albany	0.807	Inferior.
1647	June 15, 1889	J. D. Palmatier	Albany	0.813	Inferior.
1648	June 14, 1889	Turner Bros	Albany	0.808	Good.
1649	June 15, 1889	Charles Van Loon	Albany	0.805	Inferior.
1706	June 24, 1889	W. L. Purple	Albany	0.806	Inferior.
1707	June 22, 1889	J. M. Bandorf	Albany	0.804	Inferior.
1708	June 24, 1889	George Boucher	Albany	0.810	Inferior.
1709	June 22, 1889	S. C. Hodgkins	Albany	0.869	Inferior.
1710	June 22, 1889	E. F. Hunting	Albany	0.845	Inferior.
1711	June 24, 1889	William Palmatier	Albany	0.854	Inferior.
1712	June 22, 1889	E. T. Rice	Albany	0.827	Fair.
1713	June 22, 1889	W. B. Sabey	Albany	0.803	Inferior.
1714	June 24, 1889	T. K. Perry	Albany	0.810	Fair.
1742	July 5, 1889	J. S. Beaudry	Bath-on-the-Hudson.	0.909	Inferior.

1743	July 5, 1889	J. H. Miller	Greenbush	0.846	Inferior.
1744	July 5, 1889	J. F. Munger	East Albany	0.865	Inferior.
1745	July 6, 1889	T. E. Walsh	Albany	0.881	Inferior.
1746	July 5, 1889	T. L. Green	Greenbush	0.873	Inferior.

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* Second sample.

SPIRIT OF NITROUS ETHER — (*Spiritus Aetheris Nitrosi, U. S. P.*).

Two samples examined as described below, neither being of good quality. During the succeeding year it is proposed to collect and assay a large number of samples of this useful drug, which, on account of its general inferiority, is fast falling into disuse.

Number of sample.	Date of collection.	OF WHOM PURCHASED.	Where purchased.	Specific gravity at sixty degrees Fahrenheit.	Quality.
1518	April 11, 1889	J. H. Smith	Little Falls	0.846	Fair.
1519	April 11, 1889	H. G. Babcock & Co	Little Falls	0.846	Fair.

Stronger Ether — (*Aether Fortior, U. S. P.*).

Sixty-eight samples examined, of which there were of good quality, forty; fair, four; inferior, twenty-two, while one consisted of compound spirit of ether and one of sweet spirit of nitre, most carelessly sold for the article called for. This is an improvement over last year, but nevertheless is not a very good showing.

Two qualities of ether are recognized by the U. S. P., viz., "ether," specific gravity about 0.750, and containing about twenty-six per cent of alcohol, and "stronger ether," with a specific gravity not higher than 0.725, at fifteen degrees C., and containing about six per cent of alcohol. Stronger ether is generally used as an anæsthetic, and ought always to be kept in stock by the pharmacist. When it is called for by its officinal name in full it ought always to be supplied, and the substitution of common ether is entirely inexcusable, and betokens great carelessness or ignorance on the part of the seller. Particulars concerning these samples are appended:

STRONGER ETHER, U. S. P.

Number of sample.	Date of collection.	OF WHOM PURCHASED.	Where purchased.	Specific gravity at sixty degrees Fahrenheit.	Quality.
1363	July 20, 1888	G. W. Holloway	Syracuse	0.729	Good.
1364	July 20, 1888	O. B. Heyne	Syracuse	0.728	Good.
1365	July 21, 1888	P. L. Ryan & Co	Syracuse	0.726	Good.
1366	July 21, 1888	J. C. Bowe	Syracuse	0.727	Good.
1367	July 21, 1888	J. W. Young & Co	Syracuse	0.763	Inferior.
1368	July 21, 1888	Smith & Dalton	Syracuse	0.731	Fair.
1369	July 21, 1888	Dr. D. T. Whyborn	Syracuse	0.765	Inferior.
1370	July 21, 1888	E. S. Petrie	Syracuse	....	Consists of sweet spirit of nitre.
1371	July 21, 1888	Charles Hubbard & Co	Syracuse	0.763	Inferior.
1372	July 21, 1888	F. C. Joslin & Co	Syracuse	0.725	Good.
1373	July 21, 1888	Bibbens & Sherman	Syracuse	0.728	Good.
1374	July 21, 1888	S. D. Devoe	Syracuse	0.767	Inferior.
1375	July 21, 1888	Corsaw & Barnum	Syracuse	0.725	Good.
1481	March 26, 1889	C. McCulloch	Central Bridge	0.755	Inferior.
1482	March 26, 1889	Reed Hogan	Cobleskill	0.751	Inferior.
1483	March 26, 1889	G. E. Moore	Oneonta	0.723	Good.
1507	April 11, 1889	Devoe & Shumway*	Fort Plain	0.755	Inferior.
1508	April 11, 1889	E. S. Gregory*	Fort Plain	0.760	Inferior.
1509	April 11, 1889	H. G. Martin & Co.*	Fort Plain	0.726	Good.
1510	April 11, 1889	J. H. Smith*	Little Falls	0.753	Inferior.
1511	April 11, 1889	A. Woolever*	Little Falls	0.751	Inferior.
1512	April 11, 1889	M. McIntyre	Fonda	0.758	Inferior.
1513	April 11, 1889	W. S. Briggs	Fonda	0.728	Good.

1514	April	11, 1889	S. Walrath	St. Johnsville	0.758	Inferior.
1523	May	14, 1889	C. H. Bosworth*	Troy	0.727	Good.
1556	May	23, 1889	H A. Kerste	Schenectady	....	Cousists of an inferior quality of compound spirit of ether. Error in sale.
1557	May	23, 1889	Van Zandt and Shaffer	Schenectady	0.727	Good.
1575	May	31, 1889	C. A. Whipple*	Troy	0.724	Good.
1576	May	31, 1889	Wm. Brown*	Cohoes	0.763	Inferior.
1577	May	31, 1889	P. H. Spillane*	Cohoes	0.727	Good.
1578	May	31, 1889	A. G. Kiffin*	Green Island	0.724	Good.
1579	May	31, 1889	J. E. Miller*	West Troy	0.757	Inferior.
1598	June	14, 1889	W. S. Elmendorf	Albany	0.750	Inferior.
1599	June	14, 1889	G. E. Ferguson	Albany	0.727	Good.
1600	June	14, 1889	L. H. Gaus	Albany	0.723	Good.
1601	June	15, 1889	Eugene Harden	Albany	0.725	Good.
1602	June	14, 1889	J. W. Heller & Co	Albany	0.724	Good.
1603	June	15, 1889	F. W. Hoffman	Albany	0.741	Inferior.
1604	June	15, 1889	T. J. Lewi	Albany	0.724	Good.
1605	June	15, 1889	C. E. Lloyd	Albany	0.725	Good.
1606	June	15, 1889	Arch. Gilbert	Albany	0.725	Good.
1607	June	14, 1889	W. E Masten	Albany	0.723	Good.
1608	June	15, 1889	W. McAllaster	Albany	0.723	Good.
1609	June	15, 1889	Orsor & Poole	Albany	0.725	Good.
1610	June	15, 1889	Otto Ritzman	Albany	0.744	Inferior.
1611	June	14, 1889	L. Sautter	Albany	0.725	Good.
1612	June	14, 1889	Otto Scholz	Albany	0.726	Good.
1655	June	24, 1889	W. L. Purple	Albany	0.725	Good.
1656	June	22, 1889	J. Bandorf	Albany	0.731	Fair.
1657	June	22, 1889	Bassett & Brumaghim	Albany	0.725	Good.
1658	June	22, 1889	S. C. Bradt	Albany	0.726	Good.

* Second sample.

Stronger Ether, U. S. P. (*Concluded*).

Number of sample.	Date of collection.	OF WHOM PURCHASED.	Where purchased.	Specific gravity at sixty degrees Fahrenheit.	Quality.
1659	June 22, 1889	H. B. Clement & Co	Albany	0.724	Good.
1660	June 24, 1889	Dalrymple & Warner	Albany	0.746	Inferior.
1661	June 22, 1889	C. H. Gaus	Albany	0.725	Good.
1662	June 24, 1889	A. L. George	Albany	0.728	Fair.
1663	June 22, 1889	A. B. Huested & Co	Albany	0.725	Good.
1664	June 22, 1889	A. R. Miller	Albany	0.726	Good.
1665	June 24, 1889	T. W. Nellis	Albany	0.725	Good.
1666	June 22, 1889	E. T. Rice	Albany	0.725	Good.
1667	June 22, 1889	C. H. Smith & Co	Albany	0.728	Fair.
1668	June 24, 1889	F. J. Smith	Albany	0.724	Good.
1669	June 22, 1889	Wm. Sautter	Albany	0.724	Good.
1719	July 5, 1889	Wm. Herrington	Greenbush	0.761	Inferior.
1720	July 5, 1889	J. H. McIntyre	East Albany	0.745	Inferior.
1721	July 5, 1889	J. H. Miller	Greenbush	0.749	Inferior.
1722	July 6, 1889	J. DeP. Townsend	Albany	0.725	Good.
1723	July 5, 1889	D. Donnelly	East Albany	0.739	Inferior.
1724	July 6, 1889	G. R. Cardwell	Albany	0.724	Good.

Diluted Hydrobromic Acid — (*Acidum Hydrobromicum Dilutum, U. S. P.*).

Thirty-eight samples examined, of which there were of good quality twenty-five; fair, one; inferior, six, and of excessive strength, six. The Pharmacopœia requires ten per cent of the absolute acid. These samples varied between 3.8 and 21.7 per cent. Omitting the six of excessive strength, the remaining thirty-two averaged 9.8 per cent, but the individual samples will be seen, by reference to the following table, to present wide variations:

Number of sample.	Date of collection.	OF WHOM PURCHASED.	Where purchased.	Per cent.	Quality.
1393	July 20, 1888	G. A. Heyne	Syracuse	10.80	Good.
1444	March 9, 1889	C. W. Striker	Amsterdam	5.50	Inferior.
1445	March 9, 1889	Powell & Gilbert	Amsterdam	21.70	Excessive strength.
1446	March 9, 1889	E. W. Clark	Amsterdam	10.60	Good.
1447	March 9, 1889	Joseph Donnelly	Amsterdam	10.80	Good.
1448	March 9, 1889	J. A. Barkhuff	Amsterdam	9.20	Good.
1449	March 9, 1889	N. C. Becker	Amsterdam	3.80	Inferior.
1495	April 11, 1889	G. H. Ingraham	Amsterdam	17.20	Excessive strength.
1496	April 11, 1889	E. S. Gregory	Fort Plain	13.80	Good.
1497	April 11, 1889	A. Woolever	Little Falls	11.00	Good.
1531	May 14, 1889	C. H. Wiberley	Troy	13.20	Excessive strength.
1532	May 14, 1889	F. M. Brower	Troy	12.40	Good.
1533	May 14, 1889	H. Gnadendorff	Troy	9.80	Good.
1534	May 14, 1889	E. W. Stoddard	Troy	8.80	Fair.
1535	May 14, 1889	L. Barton & Co.	Troy	12.40	Good.
1566	May 23, 1889	A. T. Veeder	Schenectady	4.70	Inferior.
1591	May 31, 1889	Wm. Brown	Cohoes	16.60	Excessive strength.

DILUTED HYDROBROMIC ACID — (*Concluded*).

Number of sample.	Date of collection.	OF WHOM PURCHASED.	Where purchased.	Per cent.	Quality.
1592	May 31, 1889	P. H. Spillane	Cohoes	12.50	Good.
1632	June 14, 1889	W. S. Elmendorf	Albany	7.00	Inferior.
1633	June 15, 1889	E. Harden	Albany	10.60	Good.
1634	June 15, 1889	T. J. Lewi	Albany	10.20	Good.
1635	June 15, 1889	C. E. Lloyd	Albany	10.20	Good.
1636	June 15, 1889	Orsor & Poole	Albany	4.20	Inferior.
1637	June 14, 1889	L. Sautter	Albany	10.40	Good.
1688	June 24, 1889	Geo. Boucher	Albany	10.40	Good.
1689	June 22, 1889	S. C. Bradt	Albany	12.50	Good.
1690	June 22, 1889	H. B. Clement & Co.	Albany	10.80	Good.
1691	June 24, 1889	Dalrymple & Warner	Albany	9.20	Good.
1692	June 22, 1889	C. H. Gaus	Albany	10.20	Good.
1693	June 22, 1889	A. B. Huested & Co.	Albany	10.00	Good.
1694	June 22, 1889	A. R. Miller	Albany	16.60	Excessive strength.
1695	June 24, 1889	T. W. Nellis	Albany	12.50	Good.
1696	June 22, 1889	E. T. Rice	Albany	12.00	Good.
1697	June 22, 1889	C. H. Schaeffer	Albany	10.40	Good.
1698	June 24, 1889	F. J. Smith	Albany	5.20	Inferior.
1699	June 22, 1889	Wm. Sautter	Albany	10.80	Good.
1735	July 6, 1889	J. DeP. Townsend	Albany	11.40	Good.
1736	July 6, 1889	T. E. Walsh	Albany	14.00	Excessive strength.

Diluted Hydrochloric Acid — (*Acidum Hydrochloricum Dilutum, U. S. P.*).

Ten samples examined, of which four were of good quality; four were fair, and two of inferior strength. The Pharmacopœia requires ten per cent of the absolute acid. These samples ranged from 4.40 to 11.20 per cent, as shown in the table, and averaged 8.4 per cent.

Number of sample.	Date of collection.	OF WHOM PURCHASED.	Where purchased.	Per cent.	Quality.
1342	July 17, 1888	E. J. Smith	Buffalo	7.60	Fair.
1343	July 17, 1888	W. G. Gregory	Buffalo	8.40	Fair.
1344	July 17, 1888	C. M. Lyman	Buffalo	4.40	Inferior.
1345	July 17, 1888	T. M. Johnson	Buffalo	7.60	Fair.
1346	July 18, 1888	E. G. Boysen	Buffalo	9.20	Good.
1399	July 21, 1888	W. B. Bissell	Syracuse	11.20	Good.
1400	July 21, 1888	Charles Hubbard & Co.	Syracuse	9.60	Good.
1401	July 21, 1888	H. E. Richardson	Syracuse	6.60	Inferior.
1402	July 21, 1888	W. D. Tallman	Syracuse	11.20	Good.
1403	July 21, 1888	W. B. Fuller	Syracuse	8.40	Fair.

Ipecac — (*Ipecacuanha, U. S. P.*).

Five samples examined of the powdered drug, of which all but one were of good quality as shown below:

Number of samples.	Date of collection.	OF WHOM PURCHASED.	Where purchased.	Quality.
1422	July 21, 1888	C. H. Sherwood	Syracuse	Good.
1423	July 21, 1888	F. C. Joslin & Co.	Syracuse	Good.
1424	July 21, 1888	W. R. Pratt	Syracuse	Good.
1425	July 21, 1888	F. E. Champlin & Co	Syracuse	Good.
1426	July 21, 1888	Bibbens & Sherman	Syracuse	Fair.

DILUTED NITRIC ACID — (*Acidum Nitricum Dilutum, U. S. P.*).

Four samples tested of which one was of good quality and three were of excessive strength. The Pharmacopœia requires ten per cent of the absolute acid. The percentage strengths of the samples examined are given in the following table and varied from 9.30 to 16.70 per cent:

Number of sample.	Date of collection.		OF WHOM PURCHASED.	Where purchased.	Per cent.	Quality.
1398	July	21, 1888	Darwin Derby	Syracuse	13.40	Excessive strength.
1530	May	14, 1889	D. F. Magill	Troy	15.80	Excessive strength.
1589	May	31, 1889	M. McDermott	Cohoes	16.70	Excessive strength.
1705	June	22, 1889	S. C. Hodgkins	Albany	9.30	Good.

TARTRATE OF POTASSIUM AND SODIUM — (*Potassii et Sodii Tartras, U. S. P.*).

Three samples examined all of good quality as shown below.

Number of sample.	Date of collection.	OF WHOM PURCHASED.	Where purchased.	Quality.
1464	March 9, 1889	E. W. Clark	Amsterdam	Good.
1465	March 9, 1889	Bradford & Dickinson	Amsterdam	Good.
1466	March 9, 1889	J. A. Barkhuff	Amsterdam	Good.

IODIDE OF POTASSIUM — (*Potassii iodidum, U. S. P.*).

Eight samples examined, of which three were of good and five of fair quality. The latter either possessed too great an alkalinity or contained the sulphate or other impurities in too great quantity to comply with the pharmacopœial requirements. The samples are described in the following table :

Number of sample.	Date of collection.	OF WHOM PURCHASED.	Where purchased.	Quality.
1475	March 26, 1889	C. M. Throop	Schoharie	Good.
1476	March 26, 1889	Jonas Dillenbeck	Cobleskill	Fair.
1502	April 11, 1889	M. W. Reid	Amsterdam	Fair.
1503	April 11, 1889	J. H. Smith	Little Falls	Fair.
1504	April 11, 1889	E. I. Stinson	Little Falls	Fair.
1505	April 11, 1889	W. S. Briggs	Fonda	Good.
1506	April 11, 1889	Charles Whyland	St. Johnsville	Fair.
1554	May 14, 1889	W. H. Wilkinson	Troy	Good.

SAFFRON — (*Crocus, U. S. P.*).

Twenty-one samples examined; of which two were of good quality; one was of fair quality and of the remaining number seventeen consisted of "safflower" (*Carthamus tinctorius*) and one of "crocus martis," or red oxide of iron. Concerning the substitution of safflower for saffron I quote from my last annual report: "The saffron of the Pharmacopœia consists of the stigmas of *Crocus sativus* and is often known in the trade as Spanish saffron or true saffron. No other kind of saffron is recognized in the Pharmacopœia and when it is called for by its officinal name no other article should be substituted for it. Safflower is very cheap and is often called for, verbally, as a domestic remedy under the name of saffron but when the demand is for the pharmacopœial drug it should not be dispensed. At all events, if offered in its stead, the substitution should be explained, but no such explanation was made in any of the above cases." A description of the samples is appended:

Crocus — (*Saffron, U. S. P.*).

Number of sample.	Date of collection.	OF WHOM PURCHASED.	Where purchased.	Quality.
1416	July 21, 1888	C. H. Sherwood	Syracuse	Consists of safflower; error in sale.
1417	July 21, 1888	F. C. Joslin & Co	Syracuse	Consists of safflower; error in sale.
1418	July 21, 1888	W. R. Pratt	Syracuse	Consists of safflower; error in sale.
1419	July 21, 1888	F. E. Champlin & Co	Syracuse	Consists of safflower; error in sale.
1420	July 21, 1888	S. D. Devoe	Syracuse	Consists of safflower; error in sale.
1421	July 21, 1888	Corsaw & Barnum	Syracuse	Consists of safflower; error in sale.
1489	April 11, 1889	Bradford & Dickinson*	Amsterdam	Consists of safflower; error in sale.
1490	April 11, 1889	G. H. Ingraham*	Amsterdam	Consists of safflower; error in sale.
1491	April 11, 1889	C. W. Striker*	Amsterdam	Fair quality.
1546	May 14, 1889	W. H. Wilkinson	Troy	Consists of safflower; error in sale.
1547	May 14, 1889	F. M. Brower*	Troy	Consists of safflower; error in sale.
1548	May 14, 1889	H. Gnadendorff	Troy	Good.
1549	May 14, 1889	E. W. Stoddard*	Troy	Consists of safflower; error in sale.
1550	May 14, 1889	L. Burton & Co.*	Troy	Consists of safflower; error in sale.
1551	May 14, 1889	C. H. Bosworth*	Troy	Consists of safflower; error in sale.
1552	May 14, 1889	G. W. Holcomb	Troy	Consists of safflower; error in sale.
1553	May 14, 1889	Drake & Moffitt*	Troy	Consists of safflower; error in sale.
1567	May 23, 1889	Wm. Sauter*	Schenectady	Consists of safflower; error in sale.
1568	May 23, 1889	W. T. Hanson & Co.*	Schenectady	Consists of safflower; error in sale.
1569	May 23, 1889	A. T. Veeder*	Schenectady	Good.
1570	May 23, 1889	Van Zandt & Shaffer*	Schenectady	Consists of crocus martis; error in sale.

*Second sample.

Santonin—(*Santoninum, U. S. P.*).

Four samples examined, all of good quality as follows:

Number of sample.	Date of collection.	OF WHOM PURCHASED.	Where purchased.	Quality.
1467	March 9, 1889	Warnick & Reid	Amsterdam	Good.
1468	March 9, 1889	G. H. Ingraham	Amsterdam	Good.
1469	March 9, 1889	Joseph Donnelly	Amsterdam	Good.
1470	March 9, 1889	N. C. Becker	Amsterdam	Good.

Compound Effervescing Powder — (*Pulvis Effervescens Compositus, U. S. P.*).

Seven samples examined, of which four were of good weight and quality; two were rated as fair, the contents of the blue paper being about one-fifth short; and one as inferior, the blue paper being twenty-six per cent short weight. Seidlitz powders are generally measured and not weighed, and while it is by no means necessary that they be made with great accuracy, the contents of the papers should certainly not vary to exceed twenty per cent. Particulars concerning the samples are appended:

Number of sample.	Date of collection.	OF WHOM PURCHASED.	Where purchased.	Quality.
1473	March 26, 1889	Alfred Parrott	Schoharie	Good weight and quality.
1474	March 26, 1889	E. R. Ford	Oneonta	Blue paper 20% short; fair.
1498	April 11, 1889	M. W. Reid	Amsterdam	Good weight and quality.
1499	April 11, 1889	E. I. Stinson	Little Falls	Blue paper 17% short; fair.
1500	April 11, 1889	M. McIntyre	Fonda	Blue paper 26% short; inferior.
1501	April 11, 1889	S. Walrath	St. Johnsville	Good weight and quality.
1555	May 14, 1889	W. H. Wilkinson	Troy	Good weight and quality.

PRECIPITATED SULPHUR — (*Sulphur Præcipitatum, U. S. P.*).

Thirty-one samples examined, of which but six were of good quality; two were of fair quality; seventeen were of inferior quality, one of these being strongly acid and the others containing large quantities of sulphate of lime, while six consisted of washed sulphur ignorantly or carelessly sold for precipitated sulphur. Concerning this article I quote from my last annual report: "The sale of common *lac sulphur* for the officinal precipitated sulphur is entirely inexcusable. It is loaded with sulphate of lime, and since precipitated sulphur of good quality is easily obtainable in the market, at a slightly higher price, this substitution ought never to be made; but the above results show that the proper article was sold in less than half the cases. Pharmacists ought to be familiar with the various grades of the medicinal articles in which they deal, and a good result will be accomplished if, by calling attention to errors of this kind, an improvement in this respect can be brought about. The tests by which genuine precipitated sulphur can be distinguished from the impure commercial article are laid down in the Pharmacopœia, and are easily applied by the retailer. In this case, however, he hardly needs even to make a test, for the price he pays and name under which he buys sufficiently indicate the quality of the article supplied him." The following table gives a description of the samples:

PRECIPITATED SULPHUR, U. S. P.

Number of sample.	Date of collection.	OF WHOM PURCHASED.	Where purchased.	Quality.
1434	July 21, 1888	P. L. Ryan & Co.	Syracuse	Consists of washed sulphur; error in sale.
1435	July 21, 1888	J. C. Bowe	Syracuse	Consists of washed sulphur; error in sale.
1436	July 21, 1888	E. A. Eaton	Syracuse	Largely adulterated with sulphate of lime; inferior quality.
1437	July 21, 1888	J. W. Young & Co	Syracuse	Largely adulterated with sulphate of lime; inferior quality.
1438	July 21, 1888	E. B. Covert	Syracuse	Largely adulterated with sulphate of lime; inferior quality.
1439	July 21, 1888	Smith & Dalton	Syracuse	Consists of washed sulphur; error in sale.
1440	July 21, 1888	Newton & Hickock	Syracuse	Good.
1441	July 21, 1888	W. B. Bissell	Syracuse	Strongly acid; inferior quality.
1442	July 21, 1888	S. D. Devoe	Syracuse	Largely adulterated with sulphate of lime; inferior quality.
1443	July 21, 1888	Corsaw & Barnum	Syracuse	Good.
1541	May 14, 1889	C. H. Shacklady*	Troy	Largely adulterated with sulphate of lime; inferior quality.
1542	May 14, 1889	R. H. Starbuck*	Troy	Largely adulterated with sulphate of lime; inferior quality.
1543	May 14, 1889	C. H. Bosworth*	Troy	Good.
1544	May 14, 1889	G. W. Holcomb	Troy	Largely adulterated with sulphate of lime; inferior quality.
1545	May 14, 1889	Drake & Moffitt*	Troy	Largely adulterated with sulphate of lime; inferior quality.
1571	May 23, 1889	W. T. Hanson & Co*	Schenectady	Largely adulterated with sulphate of lime; inferior quality.

PRECIPITATED SULPHUR — (*Continued*).

Number of sample.	Date of collection.		OF WHOM PURCHASED.	Where purchased.	Quality.
1572	May	23, 1889	A. T. Veeder*	Schenectady	Good.
1573	May	23, 1889	H. A. Kerste	Schenectady	Largely adulterated with sulphate of lime; inferior quality.
1595	May	31, 1889	R. P. Tunnard*	West Troy	Largely adulterated with sulphate of lime; inferior quality.
1597	May	31, 1889	J. E. Miller*	West Troy	Good.
1650	June	14, 1889	G. E. Ferguson	Albany	Fair.
1651	June	15, 1889	F. W. Hoffman	Albany	Good.
1652	June	15, 1889	William McAllaster	Albany	Consists of washed sulphur; error in sale.
1653	June	15, 1889	H. Miller	Albany	Largely adulterated with sulphate of lime; inferior quality.
1654	June	15, 1889	Charles Van Loon	Albany	Largely adulterated with sulphate of lime; inferior quality.
1715	June	22, 1889	S. C. Hodgkins	Albany	Largely adulterated with sulphate of lime; inferior quality.
1716	June	22, 1889	E. F. Hunting	Albany	Largely adulterated with sulphate of lime; inferior quality.
1717	June	24, 1889	William Palmatier	Albany	Fair.
1718	June	22, 1889	W. B. Sabey	Albany	Largely adulterated with sulphate of lime; inferior quality.
1747	July	5, 1889	William Herrington	Greenbush	Consists of washed sulphur; error in sale.
1748	July	5, 1889	J. F. Munger	East Albany	Consists of washed sulphur; error in sale.

*Second sample.

WASHED SULPHUR — (*Sulphur Lotum, U. S. P.*).

Fifteen samples examined of which twelve were of good quality; one was of inferior quality not being washed at all but possessing all the natural acidity of the common flowers of sulphur, and two consisted of precipitated sulphur of inferior quality, sold through ignorance or carelessness for washed sulphur which was called for in writing. I quote from my last annual report: "Washed sulphur is one of the articles which has been selected for examination, not because it is a very important drug, but to test the carefulness and reliability of the dealer. The natural acidity of commercial sublimed sulphur or flowers of sulphur is removed by treatment with ammonia and subsequent washing, and as it is easily prepared by the retailer or obtained from reliable dealers, there is no reason why another article should be substituted for it or an impure article be sold."

WASHED SULPHUR, U. S. P.

Number of sample.	Date of collection.	OF WHOM PURCHASED.	Where purchased.	Quality.
1427	July 21, 1888	E. S. Petrie	Syracuse	Good.
1428	July 21, 1888	L. H. Hollon	Syracuse	Good.
1429	July 21, 1888	Charles Hubbard & Co	Syracuse	Good.
1430	July 21, 1888	D. Derby	Syracuse	Good.
1431	July 21, 1888	H. E. Richardson	Syracuse	Good.
1432	July 21, 1888	W. D. Tallman	Syracuse	Inferior.
1433	July 21, 1888	W. B. Fuller	Syracuse	Good.
1537	May 14, 1889	C. H. Wiberly*	Troy	Good.
1538	May 14, 1889	F. M. Brower*	Troy	Good.
1539	May 14, 1889	H. Schneider	Troy	Good.
1540	May 14, 1889	D. F. Magill*	Troy	Good.
1574	May 23, 1889	H. A. Kerste	Schenectady	Good.
1593	May 31, 1889	A. G. Kiffin*	Green Island	Consists of precipitated sulphur of inferior quality. Error in sale.
1594	May 31, 1889	M. A. Barnhart	Green Island	Good quality.
1596	May 31, 1889	J. L. Wright	West Troy	Consists of precipitated sulphur of inferior quality. Error in sale.

*Second sample.

DILUTED SULPHURIC ACID — (*Acidum Sulphuricum Dilutum, U. S. P.*).

Fifty-three samples examined, of which thirty-eight were of good quality; five were of fair and one of inferior quality, while nine possessed excessive strength. The diluted acid of the Pharmacopœia should contain ten per cent of the officinal sulphuric acid and have a specific gravity of about 1.067. These samples varied from 7 to 24.80 per cent. Excluding the nine samples of excessive strength the average for the remainder was 10.02 per cent. The following table gives a description of the samples:

Number of sample.	Date of collection.	OF WHOM PURCHASED.	Where purchased.	Per cent.	Quality
1404	July 21, 1888	C. H. Sherwood	Syracuse	9.60	Good.
1405	July 21, 1888	W. R. Pratt	Syracuse	12.00	Good.
1406	July 21, 1888	F. E. Champlin & Co	Syracuse	7.00	Inferior.
1407	July 21, 1888	Bibbens & Sherman	Syracuse	10.00	Good.
1529	May 14, 1889	Noncrief & Francis	Troy	9.60	Good.
1588	May 31, 1889	M. McDermott	Cohoes	10.80	Good.
1613	June 14, 1889	W. S.Elmendorf	Albany	17.50	Excessive strength.
1614	June 14, 1889	G. E. Ferguson	Albany	9.40	Good.
1615	June 14, 1889	L. H. Gaus	Albany	16.30	Excessive strength.
1616	June 15, 1889	Eugene Harden	Albany	22.00	Excessive strength.
1617	June 14, 1889	J. W. Heller	Albany	14.10	Excessive strength.
1618	June 15, 1889	F. W. Hoffman	Albany	18.40	Excessive strength.
1619	June 15, 1889	T. J. Lewi	Albany	9.90	Good.
1620	June 15, 1889	C. E. Lloyd	Albany	10.30	Good.
1621	June 15, 1889	Arch. Gilbert	Albany	10.70	Good.
1622	June 14, 1889	W. E. Masten	Albany	10.00	Good.
1623	June 15, 1889	Wm. McAllaster	Albany	8.10	Fair.

Diluted Sulphuric Acid—(*Concluded*).

Number of sample.	Date of collection.	OF WHOM PURCHASED.	Where purchased.	Per cent.	Quality.
1624	June 15, 1889	H. Miller	Albany	9.80	Good.
1625	June 15, 1889	Orsor & Poole	Albany	9.40	Good.
1626	June 15, 1889	J. D. Palmatier	Albany	9.80	Good.
1627	June 15, 1889	Otto Ritzman	Albany	9.50	Good.
1628	June 14, 1889	L. Sautter	Albany	9.20	Good.
1629	June 14, 1889	Otto Scholz	Albany	9.40	Good.
1630	June 14, 1889	Turner Bros	Albany	12·50	Good.
1631	June 15, 1889	Charles Van Loon	Albany	8.80	Fair.
1670	June 24, 1889	W. L. Purple	Albany	24.80	Excessive strength.
1671	June 22, 1889	J. M. Bandorf	Albany	11.40	Good.
1672	June 22, 1889	Bassett & Brumaghim	Albany	10.40	Good.
1673	June 22, 1889	S. C. Bradt	Albany	12.50	Good.
1674	June 22, 1889	H. B. Clement & Co	Albany	12.00	Good.
1675	June 24, 1889	Dalrymple & Warner	Albany	10.20	Good.
1676	June 22, 1889	C. H. Gaus.	Albany	11.20	Good.
1677	June 24, 1889	A. L. George.	Albany	9.60	Good.
1678	June 22, 1889	A. B. Huested & Co	Albany	10.20	Good.
1679	June 22, 1889	E. F. Hunting	Albany	8.80	Fair.
1680	June 22, 1889	A. R. Miller	Albany	9.80	Good.
1681	June 24, 1889	T. W. Nellis	Albany	10.20	Good.
1682	June 24, 1889	Wm. Palmatier	Albany	10.40	Good.
1683	June 22, 1889	W. B. Sabey	Albany	20.80	Excessive strength.
1684	June 22, 1889	C. H. Schaeffer	Albany	10.80	Good.
1865	June 22, 1889	C. H. Smith & Co	Albany	9.60	Good.

1686	June 24, 1889	F. J. Smith	Albany	10.00	Good.
1687	June 22, 1889	Wm. Sautter	Albany	9.60	Good.
1725	July 5, 1889	J. S. Beaudry	Bath-on-the-Hudson.	10.80	Good.
1726	July 5, 1889	Wm. Herrington	Greenbush	9.60	Good.
1727	July 5, 1889	J. H. McIntyre	East Albany	17.80	Excessive strength.
1728	July 5, 1889	J. H. Miller	Greenbush	15.20	Excessive strength.
1729	July 5, 1889	J. F. Munger	East Albany	8.00	Fair.
1730	July 6, 1889	J. DeP. Townsend	Albany	10.00	Good.
1731	July 6, 1889	T. E. Walsh	Albany	9.00	Good.
1732	July 5, 1889	T. L. Green	Greenbush	8.80	Fair.
1733	July 5, 1889	D. Donnelly	East Albany.	12.20	Good.
1734	July 6, 1889	G. R. Cardwell	Albany	10.20	Good.

During the period covered by this report eleven samples of water have been analyzed which were sent from the following places: Richfield Springs, three samples; Kingston, two samples; Saugerties, two samples; West Troy, one sample; Philmont, two samples; locality not stated, one sample. One sample of candy thought to contain tartar emetic or other mineral poison and one sample of corn meal said to have produced illness were examined with negative results. A report on the healthfulness of cottonseed oil, beef stearine and compound lards was made in May and opinions on various chemical questions have been given from time to time.

The total number of samples of drugs examined by me since September 1, 1885, when work was begun on the present plan, has been 1,863, an average of over thirty-seven samples for each month during which the work has been carried on. A considerable number of second samples (marked as such in the tabulated reports) were collected during the past year from dealers whose goods had been found to be of inferior quality. In many, though by no means in all, cases it will be seen the first notifications had been heeded. The work done during the past four years has received the hearty commendation of both manufacturers and leading dealers throughout the State and is believed to have had an important influence in improving the quality of the drugs dispensed and in inciting dealers to greater carefulness in their preparation and sale. In my opinion if the work is to be continued it should be upon essentially the same plan as that heretofore pursued. New localities should be visited; a wider range of samples collected and second samples obtained from a greater number of dealers where the first has been found of inferior quality. The majority of respectable pharmacists are innocent of any desire to violate the law by the sale of inferior or adulterated drugs and to secure the correction of the errors they commit, which are more frequently the result of ignorance than of design, they need, as a rule, only to be informed of them. Therefore it is believed that a general compliance with the law may ere long be secured without resorting to legal proceedings or interfering in an arbitrary manner with any legitimate industry.

All of which is respectfully submitted.

WILLIS G. TUCKER,
Analyst.

Chemical Laboratory of the Albany Medical College,
Albany, N. Y., *January* 1, 1890.

Chemical Laboratory of the Albany Medical College,
Albany, *May* 6, 1889.

Dr. Lewis Balch, *Secretary of the State Board of Health of New York, Albany:*

Dear Sir.— On the twenty-sixth of April you requested me to make such examination of "lard and lard compounds, or products into which cottonseed oil enters as a component part," and of "cottonseed oil as sold for edible purposes," as might be possible in the time intervening between that date and this day, and to report to you whether, in my opinion, such "lard, lard compounds or products are healthful or nutritious or are in any degree deleterious or injurious to health" and "whether or not said (cottonseed) oil is nutritious or healthful, or is in any degree deleterious or injurious to health."

The time at my disposal, thus allowed me, has not been sufficient to admit of the systematic collection of samples of the articles named or the elaborate analysis of such samples as have been collected, and this necessarily brief report, therefore, deals with the questions involved chiefly in a general manner, and is, in the main, based on information acquired in previous investigations and by former study of the subjects considered.

The main question as I understand it is, whether cottonseed oil properly extracted and refined is a wholesome and nutritious article of food, and whether it is a proper substance to mingle with lard obtained from the fat of hogs or with other fats in the manufacture of "lard compounds," table oil and the like for use as food, or in the preparation or manufacture of food articles. There doubtless exists on the part of many people a prejudice that lard should be made from hog fat alone and table or salad-oil from the fruit of the olive-tree solely but this opinion is in reality based on no good or sufficient reasons. Fats obtained from a variety of animals and a great number of plants have been used from time immemorial in the preparation of food and it is unreasonable to suppose that those particular fats and oils which we, in this country, or in this part of the country, have been accustomed to use are the only suitable ones to employ. All over the world vegetable oils are obtained by the expression of seeds or fruits of plants and used as food. From the cocoanut, Brazilian nut, walnut, almond and a wide variety of other vegetable products oils are extracted and employed in the preparation of food. In speaking of the vegetable oils Dr. Edward Smith in his well-known work on "Foods" places cottonseed oil at the head of the list and says: "There can be no doubt that we have in this product of seeds and plants, which seem otherwise to be useless, a great storehouse of most valuable nutritive material; and if we know but little of them in this climate, it is because we have the olive oil at hand and are bountifully supplied with many kinds of animal fats. It is, however, probable that the cheapness of some of these vegetable oils, in addition to the delicacy of their flavor will, ere long, force themselves into notice and obtain a place among our foods." This was written in 1873 when the manufacture of cottonseed oil was still in its infancy. Professor Wiley, chemist to the United States department of agriculture in bulletin No. 13 on "Foods and Food Adulterants" quotes from Allen's well-known and standard work on "Commercial Organic Analysis," as follows: "Refined cottonseed oil is of a straw or golden-yellow color, or occasionally, nearly colorless. The density ranges from .922 to .926 and the solidifying point from one to ten degrees centigrade. Refined cottonseed oil is usually very free from acid, and when properly prepared is of pleasant taste, and admirably adapted for edible and culinary purposes, for which it is now extensively employed, both with and without its nature being acknowledged." As regards the manufacture and refining of cottonseed oil, it may be remarked that the methods employed are not materially different from the processes made use of in the preparation of olive oil. That cottonseed oil has for years been exported to Italy and France, in which countries it is largely employed for mixing with olive oil, is a well-known fact. Speaking of cottonseed oil, Dunham J. Crain, United States Consul at Milan, reported as follows under date of November 10, 1883: "The seed oil industry is assuming considerable proportions. Several kinds of this oil were exhibited at the Milan exhibition in 1881, and classed among alimentary oils. There were some beautiful specimens of sesame oil exhibited. * * * The importation of cottonseed oil was arrested in 1882, since which the demand for oleaginous seeds has increased. It is therefore urged that a duty should be imposed on all imports of seeds and seed oil, if it is to be continued on cottonseed oil. It is claimed that the duty on cottonseed oil has served no good purpose; that the mixing of cotton oil with olive oil was not prejudicial to health, and that the mixture is now made with oils from flax and nuts, and that the competition formerly coming from cotton oil has been replaced by oils of other seeds and by nut oils. * * * It is felt that frauds will diminish, and the public good be promoted, when prejudices against good seed oils disappear and they are sold under their true names." (United States Consular Reports, XII, 587.)

I am clearly of the opinion that cottonseed oil, whether used alone or commingled with other oils or fats, is a perfectly wholesome and nutritious food and as easily digested and assimilated as any of the commonly employed fats. In support of this view the opinion of numberless writers upon the subject and of experts in chemistry and physiology might be adduced, but I shall content myself with citing two or three. Battershall in his treatise on "Food Adulteration" remarks: "As a result of the publicity lately given to the subject of food adulteration, a popular impression has been produced that any substance employed as an adulterant of, or a substitute for another, is to be avoided *per se*. Perhaps the common belief that for all purposes cottonseed oil is inferior to olive oil and oleomargarine to butter, is the most striking illustration of this tendency. Now, as a matter of fact, pure cottonseed oil, as at present found on the market, is less liable to become rancid than the product of the olive, and, for many culinary uses, it is at least quite as serviceable. * * * The sale of these products, *under their true name*, should not only be allowed, but under some circumstances even encouraged."

Professor Wiley stated before the United States house committee on agriculture at the hearing on the compound lard bill in 1888, in reply to the question whether from his knowledge of chemistry and of medicine there is any property in cottonseed oil injurious to health, that there was not so far as he knew. In reply to the question, "Does that statement also apply to beef stearine used in connection with cottonseed oil in the manufacture of refined lard?" he replied, "Yes, sir; so far as I know there is nothing in it injurious to health." Concerning its digestibility and the ease with which it is assimilated he instanced a case in which a pint had been given as a laxative and had undergone perfect digestion showing in his opinion "that it was very easily acted upon by the intestinal juices" and "very easily assimilated," and he added that "it seems to act on the digestive organs like olive oil precisely." In response to the question, "Are the nutritive qualities of cottonseed oil equal to the nutritive qualities of pure lard?" he replied, "I should say that there would be little difference as far as nutritive properties are concerned." Professor Wiley analyzed a large number of samples of so-called refined lards compounded chiefly of beef stearine, cottonseed oil and hog fat, and in response to the question, "Have you any belief that any of these articles or specimens * * * when used as foods are hurtful or unhealthful to the human system?" replied, "I have no reason to believe any of them are, any of the ingredients in the lards." And again, "As far as medical and chemical knowledge extends, these substances are not injurious to health." In reply to the question, "What would you say of cottonseed oil when used alone as an article of food?" he answered, "I should say that it was perfectly wholesome," and he gave it as his belief that it was as wholesome as olive oil, or hog lard or beef fat. Professor S. P. Sharpless, State Assayer for Massachusetts, and a chemist who has given much time to the study of food adulteration, stated during the course of the same investigation, that he knew of no property injurious to health in cottonseed oil or the refined lards which he had examined. Professor R. Ogden Doremus of New York city, states that refined lard made from steam lard, beef stearine and cottonseed oil is "pure and wholesome" and that in his opinion "cottonseed oil is a wholesome article of diet" and Professor L. M. Norton of the Massachusetts Institute of Technology, states that the compound lard made by a well-known firm is "a perfectly good food material" and "is unobjectionable in every respect, and does not contain anything which can be injurious to health."

These are the opinions which seem to be almost universally held by those who have investigated this subject from a scientific standpoint. So far as I know there is no evidence worthy of the name which even remotely tends to show that cottonseed oil is not a wholesome and nutritious food. It has, as a matter of fact, been used for years, both surreptitiously mixed with other oils and fats or openly employed on its merits as a palatable and useful food. Throughout the cotton-growing States it has been, for a long time, very largely used and the medical faculty of the Arkansas University state that it is to be preferred to other fats in many respects, "agreeing with the most delicate stomachs whether used in baking or frying," and that "not one instance has ever been given of health being in any manner impaired by the use however free of cottonseed oil in food." They state that "thousands of hands employed in the cottonseed oil mills are in the habit of making their dinners on the crude oil, by dipping their bread in it, and some of them actually drink it, and yet from this free use of it nothing has ever resulted but the best of health."

Such testimony as that given above is not easily overthrown. Writers of eminence in our scientific, medical and agricultural journals have borne similar testimony and large numbers of people in our midst to-day use, by preference, in their households a cottonseed oil lard in place of one made from the fat of the hog. In my own family I have employed such a lard with perfect satisfaction, and am convinced by actual trial that it is palatable, readily digestible and a wholesome, nutritious article. During the last few years I have chemically examined a considerable number of compounded lards, sold as lard and under various trade names, containing cottonseed oil, sometimes without a trace of hog fat, and I have also examined various qualities and grades of cottonseed oil and of olive oil containing it, some of these examinations having been made within the last week, and I have discovered in these lard compounds and oils no substance injurious to health or in any way deleterious, and I am decidedly of the opinion that such lard compounds and cottonseed oil products as I have examined or of which I have knowledge are wholesome and nutritious articles of food.

Yours respectfully.

WILLIS G. TUCKER,

Analyst State Board of Health.